

ABSTRACT FINAL ID: H31C-1163;

TITLE: Diagnosing the Nature of Land-Atmosphere Coupling During the 2006-7 Dry/Wet Extremes in the U. S. Southern Great Plains

SESSION TYPE: Poster

SESSION TITLE: H31C. Quantifying Pathways of Land-Atmosphere Coupling in Models and Observations II Posters

AUTHORS (FIRST NAME, LAST NAME): Joseph A Santanello¹, Christa D Peters-Lidard¹, Aaron D Kennedy³, Sujay Kumar², 1, Xiquan Dong³

INSTITUTIONS (ALL): 1. GSFC, NASA, Washington, DC, United States.

2. Science Applications International Corporation, McLean, VA, United States.

3. University of North Dakota, Grand Forks, ND, United States.

Title of Team:

ABSTRACT BODY: Land-atmosphere (L-A) interactions play a critical role in determining the diurnal evolution of land surface and planetary boundary layer (PBL) temperature and moisture states and fluxes. In turn, these interactions regulate the strength of the connection between surface moisture and precipitation in a coupled system. To address deficiencies in numerical weather prediction and climate models due to improper treatment of L-A interactions, recent studies have focused on development of diagnostics to quantify the strength and accuracy of the land-PBL coupling at the process-level. In this study, a diagnosis of the nature and impacts of local land-atmosphere coupling (LoCo) during dry and wet extreme conditions is presented using a combination of models and observations during the summers of 2006-7 in the U.S. Southern Great Plains. Specifically, the Weather Research and Forecasting (WRF) model has been coupled to NASA's Land Information System (LIS), which provides a flexible and high-resolution representation and initialization of land surface physics and states. A range of diagnostics exploring the links and feedbacks between soil moisture and precipitation are examined for the dry/wet regimes of this region, along with the behavior and accuracy of different land-PBL scheme couplings under these conditions. Results demonstrate how LoCo diagnostics can be applied to coupled model components in the context of their integrated impacts on the process-chain connecting the land surface to the PBL and support of hydrological anomalies.

KEYWORDS: [1843] HYDROLOGY / Land/atmosphere interactions, [1878] HYDROLOGY / Water/energy interactions, [3307] ATMOSPHERIC PROCESSES / Boundary layer processes.

(No Image Selected)

(No Table Selected)

SPONSOR NAME: Joseph Santanello